REQUEST FOR PROPOSALS

MARICOPA ASSOCIATION OF GOVERNMENTS
DEVELOPMENT OF A VISIBILITY MODELING SYSTEM FOR EVALUATING THE CHANGES IN VISIBILITY ASSOCIATED WITH CONTROL MEASURES IN MARICOPA COUNTY, ARIZONA

Maricopa Association of Governments
May 23, 2001

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PUBLIC NOTICE

REQUEST FOR PROPOSALS

DEVELOPMENT OF A VISIBILITY MODELING SYSTEM FOR EVALUATING THE CHANGES IN VISIBILITY ASSOCIATED WITH CONTROL MEASURES IN MARICOPA COUNTY, ARIZONA

The Maricopa Association of Governments (MAG) is requesting proposals from qualified consultants to develop a visibility modeling system for evaluating the changes in visibility associated with control measures in Maricopa County, Arizona. The estimated time frame for this project is six months from the date of the notice to proceed and the cost is not to exceed $75,000.

Detailed proposal requirements may be obtained by contacting the MAG Office at the address indicated below or by visiting the MAG web site at www.mag.maricopa.gov/Newpages/About.htm. For further information, please contact Stephen Ochs at (602) 254-6300 or email to sochs@mag.maricopa.gov.

All proposals must be delivered by 12:00 noon (Mountain Standard Time) Monday, June 25, 2001, to the MAG Office at, 302 North 1st Avenue, Suite 300, Phoenix, Arizona 85003.

SCOPE OF WORK

INTRODUCTION

The Maricopa Association of Governments (MAG) is requesting proposals from qualified consultants to develop a visibility modeling system for evaluating changes in visibility associated with control measures in Maricopa County, Arizona. To accomplish the goals of this study, the CONSULTANT will (1) identify and evaluate visibility models, review available data, and review model data requirements, (2) prepare a draft modeling protocol, and (3) transfer modeling system and supporting documentation to MAG, and provide training on the model operation at the MAG office.

The CONSULTANT performing this project should have specialized expertise in all phases of air quality and atmospheric modeling, including emission inventory development, visibility assessment, dispersion modeling, receptor modeling, and control measure evaluation. The estimated time frame for this study is six months and the total cost is not to exceed $75,000.

BACKGROUND

Maricopa County Airshed

The metropolitan area of Maricopa County is located at a relatively low latitude (33.3ºN) in an arid environment. The complex topography of the region often dictates the flow of the lower atmosphere, and as the Maricopa County area is situated in a valley surrounded by complex terrain, pollution dispersion is often limited. Furthermore, the location of the region under an area of predominant high pressure results in a consistent lack of a strong background circulation on the synoptic scale. This also precludes significant mixing of the atmosphere and transport of aerosols away from the urban area. In addition, the rapidly growing population is as important as the physical geography of the area in evaluating the air quality problems.

Air Quality Issues

The Maricopa County was designated by USEPA as Serious nonattainment area for carbon monoxide (CO), ozone, and particulate matter (PM-10). As the designated Regional Air Quality Planning Agency, MAG has successfully conducted modeling analyses for these three pollutants to demonstrate attainment status for the three pollutants by the specific years as required by the Clean Air Act. In addition, MAG conducted the Brown Cloud Study from 1997 through 1999 to investigate the causes of the brown cloud phenomena and recommend feasible measures to mitigate the visible air quality problems in the Valley.

In March 2000, Governor Jane Dee Hull established the Brown Cloud Summit. Its charge was to consider ways to improve visibility in the Valley of the Sun, and thus enhance the well-being of Valley residents. The visibility assessment of the Brown Cloud Summit was generally based upon

the PM-10 modeling inventories developed by MAG and a complex Excel workbook model. As documented in the final report released in January 2001, the Summit was not able to define quantitative relationships between emission sources and visibility-reducing aerosols.

As a continuous effort to the previous PM and brown cloud studies in the Phoenix area, MAG would like to develop a modeling system to be able to evaluate the impacts of control measures to effectively reduce the brown cloud and increase visibility in the Valley. It is preferred that the visibility modeling system be constructed as an extension to the existing air quality modeling chain of MAG. The studies closely related to the visibility problems in the Phoenix area are described below.

Regional PM-10 Modeling in Maricopa County

The initial regional PM-10 air quality modeling analysis was completed in August 1997 as required by the Clean Air Act. The modeling did not demonstrate attainment for PM-10 by the deadline of December 31, 2001 and an extension request for a later attainment date was filed with EPA. In July of 1999, the Serious Area Particulate Plan for PM-10 was submitted to EPA. The EPA notified Arizona Governor, Jane Hull, by letter in November 1999 that there was an approvability problem with the 1999 Serious Area Particulate Plan for PM-10. A Revised Serious Area Particulate Plan for PM-10 which addressed the approvability issues was submitted to EPA in early 2000.

Regional PM-10 air quality modeling was included as part of the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area*, February 2000. Areawide emission inventories needed for regional PM-10 modeling were developed using the motor vehicle traffic emissions model EXPLORA and the Emissions Preprocessor System (EPS2.0). The EXPLORA program generates PM-10, NO_x, and SO_x emission estimates for onroad mobile sources. PM-10, NO_x, SO_x, and NH_3 emissions from all other sources including stationary point, area and nonroad mobile sources such as factory stacks, agricultural activities, and construction were developed using the EPS2.0 program. Inventories were developed for an average annual day, average weekday, and average weekend day. The average annual day emissions were used for documentation of annual emissions.

Mobile source emissions from vehicle exhaust and travel on paved and unpaved roads were estimated by combining emission factors, in units of grams per mile, with vehicle miles traveled (VMT). The emission factors were obtained from PART5 and MOBILE5a, which incorporate several parameters, including fuel modifications, specific scenario conditions, and fleet characteristics. The EXPLORA program was utilized to combine the emission factors and the traffic forecasts to estimate onroad mobile source emissions. The EPS2.0 was used to develop Urban Airshed Model with Linear Chemistry (UAM-LC) emission input files for the modified base year of 1995 and the attainment year of 2006. Regional PM-2.5 emission inventories for Maricopa County for the 1994 base year were also constructed.

The Urban Airshed Model with Linear Chemistry (UAM-LC) is an air pollution dispersion model which translates emissions data into estimates of pollutant concentrations for the area of interest for specified periods of time. UAM-LC predicts concentrations of both primary and secondary PM-10. Secondary PM-10 is formed through the atmospheric reaction of NO_x, SO_x, and NH_3 emissions. The UAM-LC was validated for the modeling domain with the modified 1995 base case emission inventories to determine the applicability of the model for use in the air quality modeling process. This validation involved testing the ability of the model to reproduce monitored air quality concentrations based on the meteorological conditions and estimated PM-10 emissions assumed for the 65 design days selected according to 40 Code of Federal Regulations (CFR) Part 50, Appendix K. All qualitative and quantitative measures of model performance were within the performance criteria established in the modeling protocol.

The UAM-LC was run for 2006 with committed control measures. The Revised MAG 1999 Serious Area Particulate Plan for PM-10 demonstrated attainment with the annual and 24-hour PM-10 standards by the December 31, 2006 attainment date.

MAG Brown Cloud Study

From 1997 through 1999, the Maricopa Association of Governments conducted the 1999 Brown Cloud Study to recommend feasible measures to abate the brown clouds occurring in the Maricopa County metropolitan area. Study topics included determining if any changes had occurred since the 1989-1990 ADEQ Phoenix PM-10 and Phoenix Urban Haze studies, gathering background information on brown clouds in other western urban areas, determining the source emissions in Maricopa County primarily responsible for brown clouds, and recommending six control measures to reduce the brown cloud. The scope of the original study was expanded to include the application of source emission profiles measured in the Denver area to Maricopa County air quality data. It was found that these source profiles could explain the Maricopa County air quality data reasonably well. Also, these applications indicated that the relative importance of emission sources in the Phoenix area was similar in ranking to the Denver area.

Information on the emission sources in Maricopa County that make the largest contributions to brown clouds was derived from Chemical Mass Balance (CMB) calculations performed during this study and as part of the earlier ADEQ studies. The emission inventory information contained in the *MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area* was also used.

Results indicated gasoline engine exhaust accounts for approximately half of the ambient PM-2.5 and diesel engine exhaust accounts for about 15 percent. Gasoline and diesel exhaust account for nearly all of the carbonaceous fraction of the fine particles (organic and elemental carbon). The study reported a relatively high level of confidence in estimates for the contribution of total mobile source exhaust, ammonium nitrate, ammonium sulfate, and geological material. There was a lower level of confidence associated with the split in mobile source exhaust between diesel-powered engines and gasoline-powered engines.

As part of the 1999 Brown Cloud Study, six control measures were recommended to decrease emissions contributing to the brown cloud. The six recommended measures were chosen because they were not being implemented by other programs to reduce carbon monoxide, ozone, and particulate matter and would directly control the pollutant emission sources most responsible for the brown cloud. Due to the absence of available methodologies for evaluating the changes in visibility associated with recommended control measures, a comprehensive evaluation of the impact of the proposed measures was not conducted as part of the 1999 Brown Cloud Study.

The Governor's Brown Cloud Summit

The Governor's Brown Cloud Summit was established in 2000 by Arizona Governor Jane Dee Hull to identify and examine strategies to improve visibility in Maricopa County. An Inventory Technical Advisory Group (ITAG) was established as one Summit subcommittee. The ITAG was responsible for determining which emission inventories to use in the control measure evaluation process. In addition, the ITAG was responsible for recommending an evaluation tool to assess the impact of potential control measures on visibility.

The ITAG recommended that the Summit use the 1995, 2003, and 2006 emission inventories from the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area*. The 1995 emission inventory has been projected to 2010, 2015, and 2020 to assess control measure impacts and changes in visibility in those years. A ?roll back? based evaluation tool based on a modification of the Grand Canyon Transport Visibility Commission (GCTVC) tool was recommended by the ITAG. The Brown Cloud Assessment Tool (BCAT) was developed to assess control measure impacts on changes in visibility. The BCAT converts ambient concentrations based on a CMB analysis into reconstructed light extinction. This simplified tool was necessitated as a result of the limited time allotted for the Summit.

ADEQ Phoenix Urban Haze Study and Visibility Monitoring

The Arizona Department of Environmental Quality (ADEQ) conducted a Phoenix Urban Haze Study in 1989-1990. One of the recommendations from the ADEQ Phoenix Urban Haze Study was the establishment of separate Long-Term Urban Haze Monitoring Networks in the Phoenix and Tucson metropolitan areas. The requirement to collect urban haze trend data to assess the success of pollution control strategies was specified in Senate Bill 1360 in 1989. The ADEQ prepared a Phoenix and Tucson Long-Term Urban Haze Monitoring Plan that included the implementation and operation of optical (b_{ext} as measured by a transmissometer) and scene (35-mm photography) monitoring in Phoenix and Tucson. A nephelometer monitoring system was added to the plan after two nephelometer systems were installed by ADEQ.

The Phoenix transmissometer was initially installed the week of December 15, 1992 and is located in the Phoenix downtown area. The site path is to the north-northwest with a path distance of 4,764 meters and a path midpoint elevation of 1,200 feet. The nephelometer is located at the Phoenix Supersite at an approximate elevation of 1,200 feet.

Transmissometer and nephelometer data were collected and processed by a consultant from the winter of 1993 through the spring of 2000. Data includes total extinction coefficient reported in inverse megameters, validity/interference codes, raw hourly transmissometer data, ambient temperature, and relative humidity.

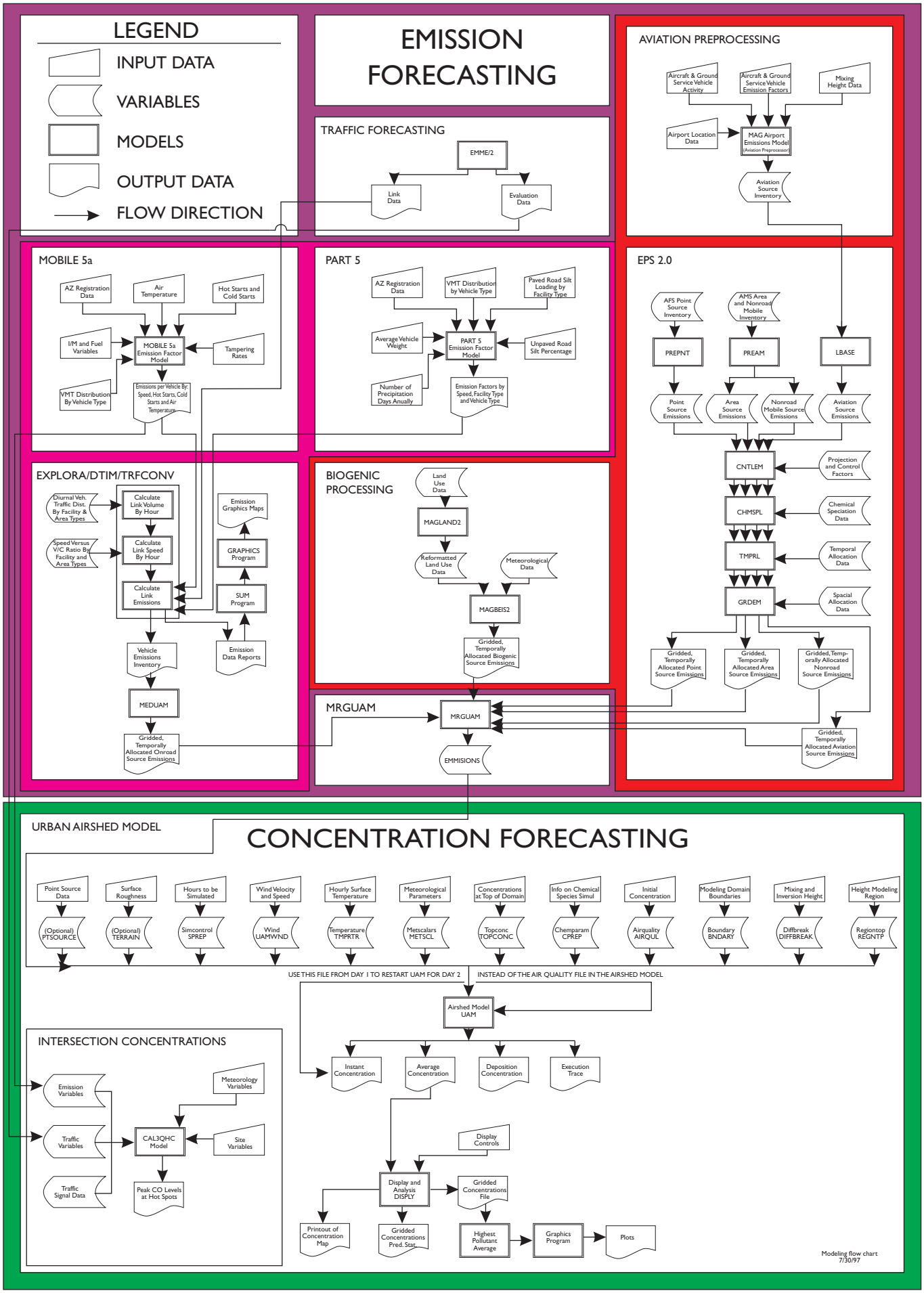
Western Regional Air Partnership Activities

The Western Regional Air Partnership (WRAP) was formed to implement the recommendations of the Grand Canyon Visibility Transport Commission (GCVTC). WRAP expanded their charter to include implementation of the regional planning processes to improve visibility in all western Class I areas by providing the technical and policy tools needed by states and tribes to implement the federal regional haze rule. WRAP has set up a technical center through UC-Davis CE-CERT to perform the air quality modeling required under the Regional Haze Rule and implementation plans. The technical center is anticipating applying the REMSAD model to the base year run. Future year runs will likely be done using Models3. Meteorology data for the base year run will be provided by EPA which is running a national MM5 run for the 1996 base year on a 36 kilometer grid.

MAG Air Quality Modeling Chain

The extensive air quality modeling chain of MAG for performing the aforementioned studies at MAG can be depicted in the flow chart in Figure 1. The modeling chain includes the use of MOBILE5a and PART5, the onroad vehicle emission factor models; EXPLORA, a program designed to calculate onroad mobile emissions for each grid square in the modeling domain; EPS2.0, emission inventory for the Urban Airshed Model (UAM); and UAM or UAM-LC (a revised UAM with linear chemistry), a three-dimensional grid model. In addition, two other three-dimensional grid models, one prognostic model, and the latest EPA mobile emission model are currently installed and under evaluation at MAG. The more sophisticated and up-to-date models under evaluation include the variable-grid Urban Airshed Model (UAM-V), the Comprehensive Air Quality Model with extensions (CAMx), the Fifth-Generation NCAR / Penn State Mesoscale Model (MM5), and EPA's MOBILE6.

FIGURE 1. MAG AIR QUALITY MODELING CHAIN



PROPOSED TASKS

The purpose of this section is to outline the major tasks to be performed by the CONSULTANT in order to produce the required analyses and deliverables. The CONSULTANT should develop a sound analytical approach that achieves the objectives of this project. It is recommended that the CONSULTANT be as specific as possible in describing the activities that will be performed to support each task. In preparing a proposal for consideration by MAG, the CONSULTANT is encouraged to be innovative in responding to task requirements. The CONSULTANT should also make maximum use of charts, tables, and drawings in working papers prepared for the project.

Task 1: Refine Work Scope

Additional refinements in the scope of work may be necessary during the contract period. The CONSULTANT may refine the scope of work, based upon professional experience, new information, or test results. Revisions to the Scope of Work will be determined jointly by the CONSULTANT and the MAG project manager. In the event that a revision is needed, the CONSULTANT will furnish the MAG project manager with one copy of an initial revised Scope of Work and Project Schedule, including a revised labor/dollar allocation and project task cost breakdown, for internal review. The CONSULTANT will incorporate any comments from MAG into a final revision and supply one copy to MAG.

Revisions to the Scope of Work will be performed under the general direction of the MAG project manager for the study. The CONSULTANT will prepare documentation of any proposed project changes, including a revised labor/dollar allocation and project task cost breakdown, and submit the revision to MAG for approval. It is important to note that the budget for this study is not to exceed $75,000, and the project Final Report is due on **February 1, 2002.** Task 1 will remain open until the contract is completed.

Task 2: Identify and Evaluate Visibility Models by Incorporating Consideration of Available MAG Models and Data

The CONSULTANT will identify and evaluate both existing visibility air quality modeling systems and those air quality modeling systems under development, and recommend at least three visibility modeling approaches for MAG. The models under evaluation should include REMSAD and MODELS3/CMAQ. The methodologies and tools used in the Governor's Brown Cloud Summit and WRAP should be included in the discussion. Components of the model evaluation will include: advantages/disadvantages, data requirements, performance of the modeling results, model conformity with the EPA Guideline on Air Quality Models, CPU time, and hard/software requirements. A tabulated comparison will be helpful. The evaluation will be based on a standard set of conditions, for example, a single spatial and temporal definition and computer platform. The CONSULTANT will comment on the ability of the model to simulate air pollutants

such as PM-10, PM-2.5, ozone, and carbon monoxide. The CONSULTANT will comment on the general methodologies, aspects for improvement, flexibility, and ease of modifications such as capable of using different chemical mechanism.

The CONSULTANT will review the modeling chain and input data from the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area*, the MAG 1999 Brown Cloud Study, the Governor's Brown Cloud Summit, and ADEQ monitoring data. The CONSULTANT will then determine the compatibility of the MAG data with each of the visibility modeling systems being evaluated. MAG has also developed a serious area plan for carbon monoxide and is in process of preparing maintenance plans for carbon monoxide and ozone. The modeling chains used for the CO and ozone plans are similar to that for the Serious Area Particulate Plan. The CONSULTANT is encouraged to review the MAG CO and ozone plans as well. After reviewing the data used in the aforementioned plans, the CONSULTANT will include in the model review: (1) the tasks and estimated costs required to process the available MAG data for use in the evaluated visibility modeling systems and (2) the tasks and estimated costs for acquiring additional data required to run the visibility modeling systems.

The CONSULTANT will provide a list of the evaluated models with the evaluation components previously described in this task, and recommend a minimum of three modeling systems to the MAG project manager for review. MAG will select one modeling system based on the review. If the CONSULTANT has identified any recommendations regarding adjustments, enhancements, or alternative approaches to the visibility modeling process, these should be included in the evaluation for review.

All models used for this visibility modeling project must be in the public domain. Models written in standard ANSI Fortran (77, 90, or 95) and/or standard C programming languages will be given preference. Models must run and yield consistent results under both the Hewlett-Packard UNIX (HP-UX 10.20) and Windows NT operating systems.

To complete this task, the CONSULTANT will prepare a working paper titled ?Evaluation of Visibility Modeling Systems and Available Data for Evaluating Visibility Changes in Maricopa County?. This working paper will document the modeling approaches considered, the evaluation process, a list of the evaluated models with the evaluation components, ranking of each model, and the three modeling systems recommended for MAG consideration.

Task 3: Prepare Modeling Protocol

Using the modeling system selected by MAG, the CONSULTANT will draft a modeling protocol which documents the overall modeling assumptions and methodology to be used in evaluating visibility changes in the Maricopa County. The protocol must be in a

similar format to that required by the EPA for SIP submissions. The protocol will also address data requirements and preparation, meteorology regimes, model performance evaluation, evaluation of control strategies, recommendation on possible improvements, and uncertainty discussions. The CONSULTANT will address the specific data input requirements relative to the available MAG data in the modeling protocol document. To complete this task, the CONSULTANT will prepare a draft Visibility Modeling Protocol document.

Task 4: Modeling Database Transfer and Training

For the selected model, the CONSULTANT will transfer to MAG all test databases, input and output files, model installation package, including source code and executable programs, and documentation for this study via diskette, CD-ROM, or another medium agreed upon by MAG and the CONSULTANT. One electronic copy and one hard copy of any documentation and/or user's guides for the modeling system should be included in the transfer. The CONSULTANT will be available to provide assistance to MAG staff during the installation and evaluation of the transferred materials at MAG.

The CONSULTANT will provide a one-day training session covering the selected modeling system for the present study. It is anticipated that this training will take place at the MAG office. The training session will include formal presentations and hands-on computer instruction in the use of the modeling system.

GRAPHICS NEEDS

For the purpose of making presentations to any MAG committee or public meeting, the CONSULTANT will use slides in Microsoft PowerPoint or Corel Presentation Format. For maximum clarity, these color slides shall make effective use of graphs, pictograms, etc., and minimal text. These slides also will minimize the use of abbreviations, acronyms, or other jargon which may be difficult for the public to understand.

The CONSULTANT will submit hard-copy drafts of all proposed graphics prior to producing and presenting actual slides. Throughout the duration of the study, the CONSULTANT will make these slides available for use by MAG, upon request. In addition, the CONSULTANT will deliver to MAG two complete sets of the final slides used in presenting the draft final report to the MAG Regional Council.

DELIVERABLES

The principal work products of this project are one working paper, one visibility modeling protocol, and electronic copies of all test databases, input and output files, model installation package, and documentation for the MAG selected model. It is important to note that the CONSULTANT name or logo should not appear on the cover page of any document submitted to MAG; however, these

may be included on subsequent pages. In preparing the written documents, it is expected that the CONSULTANT will first provide five copies of the initial draft document to MAG for internal review. The CONSULTANT will incorporate comments from the internal review into a revised working paper and submit twenty copies for external review within two weeks of receiving MAG comments. The CONSULTANT will then address or incorporate all comments resulting from the external review and submit five copies of the final working paper to MAG. The CONSULTANT should also allow for up to two one-day meetings in Phoenix.

The CONSULTANT will provide to MAG a draft copy of all materials to be presented at any meetings for review and comment at least one day prior to the scheduled meeting. Comments received from MAG will be incorporated into the presentation materials prior to the presentation. The CONSULTANT will provide MAG with paper copies of all materials (e.g. slide shows) presented at the workshops and meetings. Slide presentations for the workshops and meetings should be prepared in accordance with the requirements described in the "Graphics Needs" section of this document.

All work products created during the course of this project become the property of MAG. Work products include, but are not limited to, written reports, graphic presentations, spreadsheets, databases, data files, computer programs, and support documentation.

WORK SCHEDULE

It is anticipated that this study will commence on or about **August 1, 2001**, and be completed by **February 1, 2002**. The dates listed below are the due dates for the initial draft documents for internal review by MAG staff.

	TASK	SCHEDULE FOR COMPLETION
1.	Refine Work Scope	As Needed
2.	Identify and Evaluate Visibility Models by Evaluating Available MAG Models and Data	November 2, 2001
3.	Prepare Modeling Protocol	January 2, 2002
4.	Modeling Database Transfer and Training	February 1, 2002

PROPOSAL REQUIREMENTS

Project Cost and Schedule

The estimated time frame for this project is six months from the date of the notice to proceed and the project cost is not to exceed $75,000. The date of the notice to proceed is anticipated to be **August 1, 2001**. The working paper, visibility modeling system, modeling protocol, and supporting documentation, shall be submitted six months from the date of the notice to proceed, with intermediate deliverables due in accordance with the schedule as agreed to between MAG and the CONSULTANT(s).

Proposal Delivery

1. Twenty copies of the proposal must be submitted by 12:00 noon (Mountain Standard Time) on **June 25, 2001** to:

   Maricopa Association of Governments
   Attention: Stephen Ochs
   302 North 1st Avenue, Third Floor
   Phoenix, Arizona 85003

   Timely receipt of proposals will be determined by the date and time the proposal is received at the above address. No late submissions or facsimile or electronic submissions will be accepted. Therefore, hand delivery is encouraged to assure timely receipt.

   All material submitted in response to this solicitation becomes the property of MAG and will not be returned.

   The Proposals will be opened publicly and the name of each proposer will be read at 2:00 p.m. (MST) on June 25, 2001 at the MAG Offices, Suite 200, Palo Verde Room, 302 North 1st Avenue, Phoenix, Arizona 85003.

2. Any questions regarding this Request for Proposals should be directed to the attention of Stephen Ochs at MAG, 302 North 1st Avenue, Suite 300, Phoenix, Arizona 85003, or by telephone at (602) 254-6300. The MAG fax number is (602) 254-6490 and questions can be posed electronically to sochs@mag.maricopa.gov. Additional information regarding MAG activities, including Committee meeting schedules, may be found on the MAG website (http://www.mag.maricopa.gov).

Proposal Content

It is required that the proposal:

1. Be limited to a maximum length of thirty (30) pages, including cover letter, résumés, and appendices.

2. Be prefaced by a brief statement describing the proposer's organization and outlining its approach to completing the work required by this solicitation. This statement should illustrate the proposer's overall understanding of the project. It should also note any exceptions to the scope of work as defined by this RFP; in the absence of any such specific exceptions noted in the proposal, the deliverables for the project shall be at a minimum all of those specified in this RFP plus any additional deliverables specified in the proposal.

3. Contain a work plan which concisely explains how the consultant will carry out the objectives of the project. In the work plan, the proposer should describe each project task and proposed approach to the task as clearly and thoroughly as possible. The approach for handling contingencies including controlling costs should also be noted.

4. Include a preliminary schedule for the project in bar-chart format. Indicate all work plan tasks and their durations.

5. Contain a staffing plan for the project. The plan should include the following in table format:

    a. A project organization chart, identifying the consultant project manager.
    b. Names of key project team members and/or sub-consultants. Only those personnel who will be working directly on the project should be cited.
    c. The role and responsibility of each team member.
    d. Person-hours spent by each team member and by support personnel on each task identified in the work plan, including a total for professional hours.
    e. Hourly rate for each team member and total cost attributable to each staff member and task.
    f. Percent effort (time) of each team member for the contract period.
    g. The role and level of MAG technical staff support, if any support is required.
    h. A labor cost allocation budget, formatted as presented in the attachment.

6. Include résumés for major staff members assigned to the project. These résumés should focus on their experience in this type of project.

7. Include proposer's recent experience (last five years) in performing work similar to that anticipated herein. This description shall include the following:

    a. Date of project.

b. Name and address of client organization.
c. Name and telephone number of individual in the client organization who is familiar with the project.
d. The role played by your firm in the project (lead/sub?).
e. Short description of project, the part of the project for which your company was responsible, and the percentage of the total project that work constituted.
f. The names of the primary staff members who worked on the project and whether they are still affiliated with your firm.

Note: Additional requirements are specified in the section entitled "Regulatory Requirements" and in the appendices.

Proposal Evaluation and Selection Process

1. All proposals will be evaluated by MAG staff and an evaluation group. Evaluation criteria include, but are not limited to:

   a. Well-defined work plan consistent with program objectives.
   b. Clarity of proposal, realistic approach, technical soundness, and enhancements to elements outlined in this Request for Proposals.
   c. Education and relevant experience of personnel in similar studies. Only those personnel assigned to work directly on the project should be cited.
   d. Proven track record in this area of study. Proposers should identify the principal people who worked on past projects and the amount of time they devoted to the work effort.
   e. Availability of key personnel throughout the project effort. Adequate resources to handle a project of this scope.
   f. Ability and commitment to complete the project within the specified time period, meet all deadlines for submitting associated work products, and ensure quality control.
   g. Recognition of work priorities and flexibility to deal with change and contingencies.
   h. Cost and cost-effectiveness.

2. On the basis of the above evaluation criteria, selected firms submitting proposals may be interviewed prior to the selection of a consultant. If interviews are considered necessary, they will be scheduled at Suite 200, MAG Office, 302 North 1st Avenue, Phoenix, Arizona 85003. The firms selected for interviews will be contacted one week prior to the date of the interview, and MAG requires that the consultant project manager participate in the interview.

3. The maximum estimated time required to complete this project is six months.

REGULATORY REQUIREMENTS

1. An audit examination of the CONSULTANT'S records may be required.

2. During the course of the project, a monthly progress report must be submitted within ten (10) working days after the end of each month until the final report is submitted. Each report should include a comprehensive narrative of the activities performed during the month, an estimated percent complete for each project task, monthly and cumulative costs by task, activities of and payments to subcontractors, a discussion of any notable issues or problems being addressed, and a discussion of anticipated activities for the next month.

3. Each firm submitting a proposal is required to certify that it will comply with, in all respects, the rules of professional conduct set forth in A.C.R.R. R4-30-301 (see Appendix B), which is the official compilation of Administrative Rules and Regulations for the State of Arizona.

4. Each firm must document within its proposal any potential conflicts of interest. A conflict of interest shall be cause for disqualifying a CONSULTANT from consideration or terminating a contract if the conflict should occur after the contract is made. A potential conflict of interest includes, but is not limited to:

   a. Accepting an assignment where duty to the client would conflict with the CONSULTANT'S personal interest, or interest of another client.

   b. Performing work for a client or having an interest, which conflicts with this contract.

   c. Employing personnel, who worked for MAG or one of its member agencies within the past three years.

   MAG will be the final determining body as to whether a conflict of interest exists.

5. The firm that is selected will be required to comply with Titles VI and VII of the Civil Rights Act of 1964. The contractor will comply with Executive Order 11246, entitled Equal Employment Opportunity, as amended by Executive Order 11375 and as supplemented in Department of Labor Regulations (41 CFR Part 60). The contractor will also be required to comply with all applicable laws and regulations of the U.S. Department of Transportation.

6. The Maricopa Association of Governments reserves the right to:

   a. Cancel this solicitation.

   b. Reject any and all proposals and re-advertise.

   c. Select the proposal that, in its judgment, will best meet its needs.

d. Negotiate a contract that covers selected parts of a proposal, or a contract that will be interrupted for a period or terminated for lack of funds.

7. The Disadvantaged Business Enterprise (DBE) requirements in the Code of Federal Regulations Title 49, Part 26 will apply to this Contract. See the Appendix C, "MAG's Key DBE Regulatory Requirements". A complete copy of MAG's DBE program is available on request.

   The DBE goal for this contract is 11 percent, and the DBE must be certified by the Arizona Department of Transportation or the City of Phoenix prior to award of a contract. It is important to emphasize that the process for obtaining certification by one of these two agencies may take 60 days or more. List of acceptable DBE's can be obtained by calling the City of Phoenix at 602-262-6790 or the Arizona Department of Transportation at 602-255-7761. The consultant will report monthly regarding the utilization of DBE's.

   The consultant recommended for the project is required to provide a written statement documenting good faith efforts to meet the goal, if it has not been met. Examples of good faith efforts are found an Appendix A of Part 26 in Title 49 of the Code of Federal Regulations.

   If the successful consultant fails to meet the requirements noted above, MAG will provide the consultant an opportunity for administrative reconsideration prior to awarding a contract. Based on evidence submitted, through the MAG DBE Liaison Officer (MAG DBELO) to the MAG Assistant Director, a written determination will be made as to whether or not the proposer met the goal (or made an adequate good faith effort to meet the goal).

   MAG will also include in prime contracts with DBE goal, a provision stating that contractors shall not terminate a subcontractor for convenience and then perform the work of the terminated contractor with its own forces, or that of an affiliate without the prior written consent of the MAG DBELO. Where a Prime Contractor does terminate a subcontractor, or when a subcontractor fails to complete its work for any reason, the Prime Contractor will be required to make good faith efforts to find another DBE subcontractor to substitute for the original DBE.

8. The CONSULTANT selected to undertake the project will be required to have appropriate insurance coverage, including: commercial liability, automobile liability, workmen's compensation, property, and professional liability.

APPENDIX A

SAMPLE LABOR COST ALLOCATION BUDGET FORMAT

COSTS AND HOURS BY TASK

CONSULTANTS

Person	Direct Labor Hourly Rate	1	2	3	4	5	6	7	8	Total Hours	Total Cost
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$00.00
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$00.00
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$00.00
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$00.00
Total Hours		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$00.00
Total Cost		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
Hours Inception to Date		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

REIMBURSABLE EXPENSES — EXPENSES BY TASK

Description	1	2	3	4	5	6	7	8	Total Cost
Postage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Photocopy/Printing	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Travel	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Telephone	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Miscellaneous	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Aerial Photos	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Reimbursable Expenses	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

SUBCONTRACTORS — HOURS BY TASK

Person	Hourly Rate	1	2	3	4	5	6	7	8	Total Hours	Total Cost
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$0.00
(NAME)	$0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$0.00
Total Hours		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	$0.00
Total Cost		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
Hours Inception to Date		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

GRAND TOTAL — TOTAL COSTS BY TASK

Description		1	2	3	4	5	6	7	8	Total
Consultant Cost		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Consultant Overhead@	1.80	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Reimbursable Expenses		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Subcontractors		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sub-Total		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fee@	0.10	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
GRAND TOTAL		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

APPENDIX B

ARIZONA ADMINISTRATIVE CODE R4-30-301

ARTICLE 3. REGULATORY PROVISION

R4-30-301. Rules of professional conduct:

A. All registrants shall comply substantially with the following standards of professional conduct:

1. A registrant shall not submit any materially false statements or fail to disclose any material facts requested in connection with his application for certification.

2. A registrant shall not engage in fraud, deceit, misrepresentation, or concealment of material facts in advertising, soliciting, or providing professional services to members of the public.

3. A registrant shall not knowingly sign, stamp, or seal any plans, drawings, blueprints, land surveys, reports, specifications, or other documents not prepared by the registrant or his bona fide employee.

4. A registrant shall not knowingly commit bribery of a public servant as proscribed in A.R.S. 13-2602, or knowingly commit commercial bribery as proscribed in A.R.S. 13-2605, or violate any Federal statute concerning bribery.

5. A registrant shall comply with all Federal, State, and local building, fire, safety, real estate, and mining codes, and any other laws, codes, ordinances, or regulations pertaining to the registrant's professional practice.

6. A registrant shall not violate any State or Federal criminal statute involving fraud, misrepresentation, embezzlement, theft, forgery, or breach of fiduciary duty, where the violation is related to the registrant's professional practice.

7. A registrant shall apply the technical knowledge and skill which would be applied by other qualified registrants who practice the same profession; a contemporary "Manual of Surveying Instructions" issued by the Bureau of Land Management, United States Department of Interior and in effect prior to May 23, 1983 to the extent applicable to that professional engagement.

8. A registrant shall not accept an assignment where the duty to a client or the public would conflict with the registrant's personal interest or the interest of another client without full disclosure of all material facts of the conflict to each person who might be related to or affected by the project or engagement in question.

9. A registrant shall not accept compensation for services related to the same project or professional engagement for more than one party without making full disclosure to all such parties and obtaining the express written consent of all parties involved.

10. Except as provided in Paragraph 11 of this rule, a registrant shall not accept any professional engagement or assignment outside his professional registration unless:

    a. He is qualified by education, technical knowledge, or experience to perform such work, and

    b. Such work is both necessary and incidental to the work of his profession on that specific engagement or assignment.

    A registered professional engineer may accept professional engagements or assignments in branches of engineering other than that branch in which he has demonstrated proficiency by registration, but only if he has the education, technical knowledge, or experience to perform such engagements or assignments.

11. Except as otherwise provided by law, code, ordinance, or regulation, a registrant may act as the prime professional for a given project and select collaborating professionals; however, the registrant shall perform only those professional services for which he is qualified by registration to perform and shall seal and sign only the work prepared by him or by his bona fide employee working under his direct supervision.

12. A registrant shall make full disclosure to all parties concerning:

    a. Any transaction involving payments to any person for the purpose of securing a contract, assignment, or engagement, except for actual and substantial technical assistance in preparing the proposal; or

    b. Any monetary, financial, or beneficial interest the registrant may hold in a contracting firm or other entity providing goods or services, other than the registrant's professional services, to a project or engagement.

13. A registrant shall not solicit, receive, or accept compensation from material, equipment, or other product or services suppliers for specifying or endorsing their products, goods, or services to any client or other person without full written disclosure to all parties.

APPENDIX C

MAG'S KEY DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM REQUIREMENTS FOR CONSULTANT CONTRACTS

APPENDIX C
MAG'S KEY DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM REQUIREMENTS FOR CONSULTANT CONTRACTS

The Disadvantaged Business Enterprise (DBE) requirements in the Code of Federal Regulations Title 49, Part 26 will apply to this contract. A complete copy of MAG's DBE Program is available by request to Rebecca Kimbrough, DBE Liaison Officer, at 602/254-6300.

The Consultant will agree to ensure that DBEs, as defined in 49 CFR 26, have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this agreement.

DBE Participation Goal and Reporting:
The DBE participation goal for this contract is 11% of the contract award. DBEs used for this contract must be certified by the Arizona Department of Transportation or the City of Phoenix prior to the award of the contract. A list of Certified DBE organizations is available at the Civil Rights Office of the Arizona Department of Transportation or the City of Phoenix.

The Consultant will be required to report monthly on: (1) the utilization of any subcontractors, and (2) any payments made to subcontractors (DBEs and non-DBEs).

Requirement for Proposal:
All firms proposing on this project will be required to include a completed "Proposer's Registration Form" (See Appendix D) with their proposal. In addition, a completed Proposer's Registration Form must be included with the proposal for any subcontractors used on this project.

General Requirements for Proposals and Contract:
All proposers will be required to include the following information in their proposal and contract:

a. A clear and concise description of the work that each DBE will perform
b. The dollar amount of the participation of each DBE firm participating
c. Written documentation of the proposer's commitment to use a DBE subcontractor(s) whose participation it submits to meet a contract goal
d. If the contract goal is not met, evidence of good faith efforts to meet the goal

Contractor and Subcontractor Assurance:
MAG will incorporate into each contract it signs with a Prime Contractor, and require in each subcontract (that a Prime Contractor signs with a Subcontractor), the following assurance:

> "The Contractor, Subrecipient or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is

a material breach of this contract, which may result in the termination of this contract or such other remedy as MAG deems appropriate."

Prompt Payment Provision:
"The Prime Contractor will pay Subcontractors for satisfactory performance of contracts no later than fourteen (14) calendar days from the date that the Prime Contractor receives payment from MAG. The Prime Contractor will also return retainage payments to the Subcontractor within fourteen (14) calendar days from the date of satisfactory completion of work."

Prime Contractors must:

- Provide the Subcontractor with the name, address and phone number of the person to whom all invoices/billings and statements must be sent.
- Pay Subcontractors and suppliers within fourteen (14) days of receipt of payment from MAG.
- Stipulate the reason(s) in writing to the Subcontractor or supplier and to MAG for not abiding by the prompt payment provision. Possible reasons include:
    1. Failure to provide all required documentation
    2. Unsatisfactory job performance
    3. Disputed work
    4. Failure to comply with other material provisions of the contract
    5. Third-party claims filed or reasonable evidence that a claim will be filed
    6. Reasonable evidence that the contract cannot be completed for the unpaid balance of the contract sum or a reasonable amount for retainage.

Subcontractors must:

- Submit invoices or billing statements to the Prime Contractor's designated contact person in an appropriate format and in a timely manner. The format and the timing of billing statements must be specified in the contract(s) between the Prime Contractor and the Subcontractor(s).
- Notify MAG in writing of any potential violation of the prompt payment provision.

MAG will implement appropriate mechanisms to ensure compliance with the requirements of all program participants. The mechanisms MAG may use include, but are not limited to:

1. MAG will notify Subcontractors (DBE and Non-DBEs) of the Prime Contractor's responsibility for prompt payment and encourage Subcontractors to notify MAG in writing with any possible violations to the prompt payment mechanism.
2. Withholding payment from Prime Contractors who do not comply with the prompt payment provision noted above, where it has been determined by the MAG DBELO that delay of payment to the Subcontractor is not justified.
3. Stopping work on the contract until compliance issues are resolved.
4. Terminating the contract.

MAG will verify that the work committed to DBEs, at the time of the contract award, is actually performed by DBEs. This will be accomplished by:

1. Requiring Prime Contractors to report Subcontractor(s) (DBE and Non-DBEs) work performed in each monthly progress report along with an indication of the number of hours worked, any costs incurred and the amounts paid to the DBE(s).
2. Ensuring that DBE participation is credited toward the overall goal or contract goal(s) only when payments **are actually made** to DBE firms.

APPENDIX D

PROPOSER'S REGISTRATION FORM

APPENDIX D

PROPOSER'S REGISTRATION FORM

All firms proposing as prime contractors or subcontractors on Maricopa Association of Governments (MAG) projects must be registered. **Please complete this form and return it with your proposal**.

If you have any questions about this registration form, please call (602) 254-6300. A listing of all proposer's for this project will be available on the business day following the submittal deadline.

1. GENERAL INFORMATION:

Name of Firm:

Street Address:
City, State, ZIP

Mailing Address:
City, State, ZIP

Telephone Number:
Fax Number:
E-mail address:
Web address:
Year firm was established:

Check all that apply:
Is this firm a prime consultant? _____
Is this firm a sub-consultant? _____ Identify speciality: _____
Is this firm a certified DBE? _____ If so, by whom? _____

2. FINANCIAL INFORMATION

Firm's annual gross receipts (average of last 3 years):
_____ <$300,000
_____ $300,000 - $599,999
_____ $600,000 - $999,999
_____ $1,000,000 - $4,999,999
_____ >$5,000,000

Information will be maintained as confidential to the extent allowed by federal and state law.

The undersigned swears that the above information is correct. Any material misrepresentation may be grounds for terminating any contract which may be awarded and initiating action under federal and state laws concerning false statements.

_____ _____
Name, Title Date

APPENDIX E

PROGRESS REPORT FORMAT

(Progress Report Format)

(Consultant's Letterhead)
April 15, 1998

(MAG Project Manager)
(Title)
Maricopa Association of Governments
302 North First Avenue, Suite 300
Phoenix, Arizona 85007

Re: Progress Report No. 3 and Invoice for the Period of March 1998

For Each Task, the CONSULTANT is to provide the percent of work completed to date, a narrative describing the work accomplished, data obtained, problems encountered, meetings held and reports and/or data produced. It is the responsibility of the CONSULTANT to document that the work accomplished for each task during the reporting period is commensurate with the amount of money billed for the task in the invoice.

The narrative describing the work accomplished should be of sufficient detail to enable the project manager to clearly understand the progress on the task during the reporting period. Wherever possible, the CONSULTANT should submit along with the progress report appropriate documentation of work accomplished, such as partial or complete draft technical reports or working papers, etc.

The following is a hypothetical example of a progress report:

TASK 1 - DATA COLLECTION

Percent of Work Completed: 100 percent.

Work Accomplished: A database in both hardcopy and electronic format was developed and a methodology for keeping the database current was established.

Data Obtained: Information on the transportation facilities was secured for each of the facilities in the study area. The data included, but was not limited to: name, location, and current and historical traffic levels.

Meetings Held: The following meetings were held in connection with the data collection effort:

March 15, 1998, with the MAG project manager to review data collected for the facilities.

March 21, 1998, with the Advisory Committee to obtain input on the data collection process.

March 23, 1998, with MAG staff to review comments on the preliminary database.

March 25, 1998, with the public and special interest groups to obtain input on the distribution of the database.

Reports or Data Produced: A database in electronic format was produced and provided to MAG staff on March 29, 1998.

TASK 2 - INVENTORY

Percent of Work Completed: 100 percent.

Work Accomplished: A facilities inventory was completed and the data obtained in Task 1 were compiled into a Draft Inventory Technical Report for distribution to the Advisory Committee.

Data Obtained: See Task 1.

Meetings Held: The following meetings were held:

March 1, 1998, met with MAG staff to finalize the outline for the Inventory Technical Report.

March 10, 1998, met with the MAG project manager to obtain suggestions on methods for comparing facility information.

Reports or Data Produced: A draft Inventory Technical Report was produced and distributed to members of the Advisory Committee for review and comment.

TASK 3 - FORECASTS

Percent of Work Completed: 100 percent.

Work Accomplished: Forecasts of travel demand on inventoried facilities were prepared for 2000, 2010 and 2020. The forecasts were consistent with County control totals reviewed by the Advisory Committee last month. The forecasts included a breakdown by facility type.

Data Obtained: See Task 1.

Meetings Held: March 21, 1998, met with MAG staff to discuss comments on preliminary forecast results.

Reports or Data Produced: A draft forecast report was produced and distributed to members of the Advisory Committee for review and comment.

TASK 4 - DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

Percent of Work Completed: 60 percent.

Work Accomplished: An hourly capacity was computed for each of the inventoried facilities using the Federal guidance provided by MAG staff.

Data Obtained: See Task 1.

Meetings Held: A meeting was held with MAG staff on March 25, 1998 to discuss the differences between capacity calculations for this study versus previous studies.

Reports or Data Produced: None. However, a draft set of hourly capacity estimates, documenting the assumptions and data input used to prepare the estimates, is enclosed.

TASK 5- ALTERNATIVES

Percent of Work Completed: 25 percent.

Work Accomplished: Other regional plans were examined to determine the type of alternatives that were used to meet future demand.

Data Obtained: Regional plans from San Diego, Los Angeles, Denver, Seattle, Tucson and Chicago were collected.

Meetings Held: On March 18, 1998, a meeting was held with planners from the Pima Association of Governments to discuss alternatives.

Reports or Data Produced: None.

TASK 6 - EVALUATION OF ALTERNATIVES

Work on this task has not begun.

TASK 7 - RECOMMENDATIONS

Work on this task has not begun.

TASK 8 - IMPLEMENTATION

Work on this task has not begun.

Problems Encountered: Some of the capacity calculations prepared for the study were different from those used in previous studies. These differences were discussed and resolved at a meeting with MAG staff on March 25, 1998.

Invoice

The enclosed invoice is for the third progress payment of $17,679.20. The total amount billed to date is $48,250.

Sincerely,

Elmer White
Senior Consultant

Enclosure

cc: Mr. Arnold Black
Dr. Joseph Brown